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SOME PROBLEMS
OF LABOUR PSYCHOLOGY
and
LABOUR TRAINING

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The aim of my report is to inform the Congress about some researches of the Laboratory of Labour Psychology that I am at the head of, at the Research Institute of Psychology under the Academy of Educational Sciences of the RSFSR. Research work has been carried out in three directions: psychology of industrial labour, vocational training and the problems of general labour training in secondary school.

The task of these researches is the determination of psychological principles that must be laid down in the basis of organization of labour activities in industries and of methods of labour training in order not only to raise the productivity of labour and facilitate it, but to create most favourable conditions for the general development of a human operator, to improve his vocational abilities, so that he could adopt an active, creative attitude towards the solution of industrial problems.

We consider the labour process as a mobile system of mutually connected and mutually depending upon each other actions united by the final goal of labour activities in one whole process which is characterized by the strict definitiveness, groundness and logical succession of actions, their ends, conditions and methods of implementing.

The realization of such a structure in the process of labour is brought about on a double basis: on the basis of reproductive activities of a human operator, reproducing in his actions the instructions he received and methods of carrying out working assignments which he adopted before, and on the basis of his creative mental activities by means of which he finds new, more rational methods and forms of

organization of the labour process, and forms that provide the conformity of conducted operations to the new tasks and conditions which emerge in the process of labour. The study of different structures of labour activities and their forming in the process of labour and labour training is the main task of our researches.

The planning of work by a worker himself, kind of accomplishing the schemed plan, control of the process and results of work, reconstruction of skills when mastering new technology — such have been the chief characteristics of a style or structures of work activities studied by us in industrial labour.

In labour training, besides the above mentioned aspects? we studied the effectiveness of various forms of instructing, assimilation and accomplishment of instructions by pupils and independent organization by them of the labour process in carrying out assignments identical to those that were done under the teacher's control.

Now, what have been done on these mentioned problems?

S. N. Arkhangelsky devoted his research work to the problem of planning. He studied this process on the activities of workers of textile and shoemaking industries. The results of his work have shown that serious differences are observed, first of all, in respect of aims which the workers put before themselves when planning the future work. An average worker, starting the work, has in his mind chiefly a successful fulfilment of the respectively planned output on the basis of standard, usual for him forms of the organization of work. Less skilful worker, besides fulfilling the planned output, includes in his plan the overcoming of difficulties, proceeding from insufficient assimilation of the methods of accomplishing separate links of a labour process. The planning of advanced workers is characterized by searching more perfect forms of organization of a labour process that would provide not only an increase of the quantity and the raising of quality of the product, but would economize the materials, reduce the time of tools being idle, lengthen the time of their work, economize power, etc.

Of rather different character is the planning in the process of work itself. An essential feature of the planning by the advanced worker is its mobility and improvement in the process of work. Examining the work of textile workers and shoemakers, S. N. Arkhangelsky has established that there are several kinds of planning just in the process of work. The most elementary of them is the planning according to «pre-

sent orientation-marks», when the worker is planning his movements and actions basing on changes in the working situation that he perceives at the present moment, while most perfect is the «perspective planning», registered in the practice of advanced workers. In this case the worker has in mind the plan of his activity as a whole and foresees it far ahead. Under such more wide and more purposeful planning particular tasks are being combined into «operative formulae», superfluous actions are excluded while additional operations are included which cannot be observed during the work upon the present orientation-marks. According to some studies best textile workers plan over 90 per cent of their operations while best textile workers plan over 30 per cent of their operations while those who only fulfil the planned output — nearly a half of them.

On the basis of the study of planning we organized an experimental training of the perspective planning for separate workers in shoemaking and textile industries. As a result of it we got not only a considerable raise in the productivity of labour, but the reduction of its tension as well.

Studying the second of the above mentioned problems — the character of the realization of the labour process — we have had a chance to state serious differences in the structure of work activities. One of such differences is the difference in the proportion of machine and auxiliary time. Thus, for example, the studies (by V. V. Chebusheva and D. A. Oshanin) have proved that there are great differences between workers in respect of the length of time and its varieties which is being spent to auxiliary operations. More thorough examination of the working process of these workers leads to the conclusion that at one and the same level of skills for accomplishing separate operations these differences are conditioned by various degree of activities, displayed by the workers, their attitudes towards certain kind of activities and additional operations, different content of problem which are being put by the worker himself in the course of fulfilling some work, various levels of the technological outlook and by a number of psycho-physiological factors.

Therefore, when elaborating the measures for rationalization of the labour process, one must consider separate actions and movements not in an isolation, but in a system of the given activity as elements of the more complex structures.

In the study of a third problem, mentioned by us, namely the control of workers' activities researcher by V. V. Che-

byshova), it was shown that one of the chief reasons for few cases of insufficient control and low quality of the products is the change in the structure of the working process that have been made by the worker without sufficient grounds due to an insufficient understanding of technological requirements, underestimating of losses, connected with correcting defects and insufficient control of the quality of products manufactured by the worker. The comparison of the psychological features of workers with various qualities of production showed that the workers, combining high productivity with better quality of production, possess a wide technological outlook and higher level of general culture and industrial skills and more serious attitude towards their work.

The comparison of control activities of pupils with control activities of workers of high qualification (studied by N. I. Kuvshinov) proved that main causes of spoilage in the work of pupils are insufficient time devoted to control, rare use of it, insufficient quantity of methods which provide the correspondence of conducted movements and actions, continuously changing in the process of work, to particular tasks.

An important place in the study of self-control in the process of work is occupied by the examination of role of audible and visual control in the process of learning. E. A. Soloviyova made studies in mutual relations between audible and visual self-control in the process of forming habits of broadcasting. The experiment demonstrated considerable advantage of the method of learning, that combined an audible control with a visual one, over the method based solely on audible control.

In connection with a continuous improvement in industrial technology, of special importance is the problem of reconstruction of workers' industrial skills in the course of mastering new technology. The research work (by V. V. Suvorova) at a machine-tools construction plant has shown that if new technology is mastered, then wrong and unproductive actions of new workers qualitatively differ from wrong and unproductive actions of skilled workers. Mistakes of the new workers come from the lack of necessary knowledge and experience while mistakes and unproductive actions of the skilled workers in the course of work reconstruction are the results of necessity to break previously adopted skills and actively adopt themselves to the new conditions and methods of work. Facts, established during the research work, show that even simplification of an operation by means of exclu-

ding some components from the working process slows down the work and increases the number of mistakes, difficulties and intervals not only in the new components of skills, but in the old as well, which has been fulfilled before easily and without any mistakes. This means that reconstruction of skills must be regarded as not only a change in some separate methods, but as a change of the structure of labour process.

A comparison of skill reconstruction with original process of their forming (research by T. N. Borkova) showed that the exercises of persons who quickly achieved the required level of skills in the course of their formation and reconstruction, in most cases, at first stage of learning and re-learning, were characterized by slowness and high accuracy, whereas the exercises of persons whose skills had been formed with great difficulties, were characterized in learning and reconstruction by an excessive acceleration of reactions and by their low accuracy. These conclusions present a considerable interest from the point of view of organization of exercises for the process of learning and skill reconstruction.

Now, I pass over to some works, accomplished by our Laboratory on the problems of labour training in the primary and secondary schools and vocational schools as well.

First, I shall briefly say about what we mean by labour training in schools.

Labour training in the Soviet Union is started at the lessons of manual labour in primary classes; it is continued in school workshops and is completed in senior classes with industrial practice at works and factories. In accordance with polytechnical education principles pupils are required to acquire that general knowledge, skills and abilities that would allow school-graduated to easily master various kinds of vocational work in industries.

At the same time, the labour training has its aim the development of such personal qualities of pupils as love for work (as the source of high satisfaction), activity, resourcefulness, creative initiative, abilities of using in practice the knowledge and habits, acquired at school, ability to independently overcome difficulties in work, persistence, sense of responsibility for both individual and collective work.

Now, let us see what should be the content and organization of pupils' labour activities at school from the psychological point of view, so that to provide the development of the above mentioned abilities, skills and personal qualities.

To examine these problems, we have made special studies in order to establish forms and the role of instructions in the course of the labour training and also the role of pupils' exercises in their independent organization of the labour process.

Since the labour process is always composed of a number of successively taking place actions, the primary task of a pupils, fulfilling some work assignment, is the selection of actions, corresponding to the aim and conditions, put before them, and the determination of their succession, and also the methods of their accomplishment. Examining these questions, an individual starting the work, leans upon the knowledge and skills, acquired by him before. However, the previous experience is often insufficient. Especially difficult is the solution of these problems for those who start this kind of work for the first time. Therefore, in order to prevent pupils from making mistakes and spoilage in their work at school and industrial enterprises, teachers and masters refer to instructive conversations and various visual aids in the form of showing standard articles, demonstrating motions and actions, written instructions, technical drawings that detail the problems, arrangement and methods of the future work.

By these means the labour process is cut into a number of operations or separate problems and actions. The instructions clarify the leading principles or regulations in achieving the given task. The various visual aids point out and most effective methods of accomplishing ~~both~~ separate actions and their complexes. Providing certain initial theoretical foundations for future activities, the instructive materials considerably facilitate the planning and fulfilling of the future work and promote the raise of quality and quantity of production and accelerate the forming of labour skills and abilities. That is why the elaboration of psychological foundations of the methods of acquainting pupils with labour activities is one of the most essential problems of labour training psychology.

Yet, learning instructions, rules and regulations, imitating the leader, executing the operations according to a ready scheme,— all this does not guarantee the development of pupils' creative activities, though it does promote quicker assimilation of some special skills. Believing in the authority of a master or a teacher, some pupils try only to remember and keep in mind the methods, principles, and actions they are taught without considering their reciprocal

relations and any attempts to understand why they are most rational. As a result of it, the improvement of the process of production with a consequent raising of quality and quantity of production and better organization of the working process, presents considerable difficulties for the workers, who adopted instructions in a passive way. These workers have great difficulties in a situation that has not been described in the instructions. An independent change of passively adopted labour process comes out to be too complicated problem under such circumstances. Our observations at the lessons of manual labour in primary classes as well as individual experiences have shown that some pupils, successfully fulfilling labour assignments under the leadership of a teacher, failed to execute the same work independently. The analysis of the work of such pupils at lessons showed a passive character of their exercises.

Favourable conditions for the development of technical thinking, creative activities, resourcefulness, inventiveness are being created with an active method of labour training when the teacher encourages pupils to act not only in strict accordance with the instructions, but independently, under the conditions of partial fulfilment or absolute absence of the instructions. In such cases the pupil has to choose actions and set up the labour process on the basis of his own analysis of the labour process and its conditions, examining the correctness of his actions and decisions in practice.

To find the methods of activization of pupils' mental activities in the course of accomplishing labour assignments and forming their abilities to organize an easy labour process independently, we have arranged, in cooperation with school teachers, experimental teaching. During the teaching the pupils, after exercises that provide the possibility of successful accomplishing separate operations were suggested the tasks, requiring an independent construction of series of actions, first short ones, consisting of two-three actions, and then more complicated. A comparison of results of control-works, executed at the end of a learning year by the pupils of experimental and control classes, showed essential advantages of the experimental class pupils in regard to the abilities to organize the labour process independently. The general quantity of wrong actions of the experimental class pupils in the course of fulfilling control-works was two times less as against control class pupils (experimental class — 70 wrong actions, control class — 157 under more favourable general learning conditions). The experimental class pupils

were more successful in the transition of previously adopted abilities in the course of accomplishing a new task that had not been taken before.

In order to define the role of separate elements of instructions in the process of forming labour abilities by the pupils of vocational schools (V. V. Chebysheva), has made a study with the aim of establishing the role of word, image and action in teaching. The pupils were required to execute a series of new to them work assignments on the basis of a mere explanation or a mere demonstration. The examination has shown that the works which have been done on the basis of verbal explanation were of better qualities, but required more time. Demonstration has led to worse quality if compared with an explanation, but it was done quicker. The combination of these methods eliminated the mentioned drawbacks and provided quicker fulfilment than in the first case and better quality of work than in the second one. A weak point of this combination was the possibility of their mutual influence upon each other. Trying to better understand and remember the instructions during the explanation, some pupils did not sometimes notice the details before their eyes and, on the contrary, concentrated the attention on the assimilation of the shown objects, missing separate points of the explanation. The difference between explanation and demonstration was also exposed in the methods, used by the pupils in their actions. In the course of the demonstration the pupils imitated the leader and used methods he had shown to them whereas in the explanation the pupils independently used methods they chose though these methods were not always effective.

I have had a chance to say about only a part of work of our Laboratory, and its research work, in its turn, is a small part of researches on the problems of labour psychology and labour training, which are being conducted in the Soviet Union by universities and special research institutes.